

CLAIMS

WE CLAIM:

1. A method of culturing embryonic stem (ES) cells with reduced differentiation comprising:
 - a) growing the cells in culture on a flexible solid porous matrix without conditioned media and in the absence of fibroblast feeder cells; and
 - b) applying an effective amount of periodic strain to stretch the flexible matrix, such that the cells proliferate and exhibit reduced differentiation.
2. The method of Claim 1 wherein the cells are mammalian embryonic stem cells.
3. The method of Claim 1 wherein the cells are human embryonic stem cells.
4. The method of Claim 1 wherein the cell differentiation is eliminated.
5. The method of Claim 1 wherein the cells are grown on Matrigel™ using BioFlex® untreated culture plates.
6. The method of Claim 1 wherein the cells are grown without the presence of cross-species biological material.
7. The method of Claim 1 wherein the flexible matrix is Matrigel™.
8. The method of Claim 1 wherein the strain is mechanically produced.
9. The method of Claim 1 wherein the flexible matrix is stretched using vacuum pressure.
10. The method of Claim 1 wherein the strain exerted on the flexible matrix is at least about 5%.
11. The method of Claim 1 wherein the flexible matrix undergoes at least about 6 stretches per minute.

12. The method of Claim 1 wherein the mechanical strain is from oscillatory stretching of the flexible matrix surface.
13. A culture comprising embryonic stem (ES) cells grown on a flexible solid porous matrix without conditioned media or fibroblast feeder cells, wherein an effective amount of periodic strain is applied to stretch the flexible matrix, such that the cells proliferate and exhibit reduced differentiation.
14. The method of Claim 13 wherein the cells are mammalian embryonic stem cells.
15. The method of Claim 13 wherein the cells are human embryonic stem cells.
16. The method of Claim 13 wherein the cell differentiation is eliminated.
17. The method of Claim 13 wherein the cells are grown on Matrigel™ using BioFlex® untreated culture plates.
18. The method of Claim 13 wherein the cells are grown without the presence of cross-species biological material.
19. The method of Claim 13 wherein the flexible solid porous matrix is Matrigel™.
20. The method of Claim 13 wherein the strain is mechanically produced.
21. The method of Claim 13 wherein the flexible matrix is stretched using vacuum pressure.
22. The method of Claim 13 wherein the mechanical strain is from oscillatory stretching of the flexible matrix surface.
23. The method of Claim 13 wherein the strain exerted on the flexible matrix is at least about 5%.

24. The method of Claim 13 wherein the flexible matrix undergoes at least about 6 stretches per minute.